# TECHNICAL INFORMATION

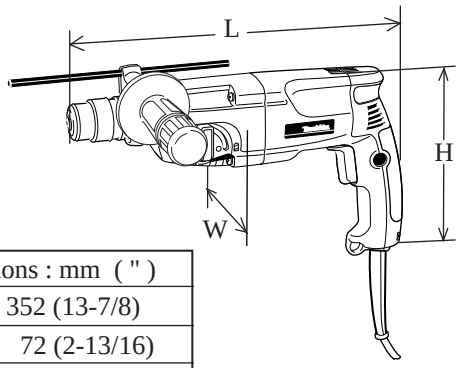


**Model No.** ► HR2440, HR2441, HR2442

**Description** ► Rotary Hammer 24mm (15/16")

## CONCEPT AND MAIN APPLICATIONS

The above models are the advanced version of MAKITA's famous 2-modes 2Kg rotary hammer HR2410
Each new model features ;
HR2440 : with variable switch and reverse switch
HR2441 : with variable switch, without reverse switch
HR2442 : with single speed switch, without reverse switch




| Dimensions : mm ( " ) | |
|---|---|
| Length ( L ) | 352 (13-7/8) |
| Width ( W ) | 72 (2-13/16) |
| Height ( H ) | 204 (8) |

## ► Specification

| Voltage (V) | Current (A) | Cycle (Hz) | Continuous Rating (W) | | Max. Output(W) |
|---|---|---|---|---|---|
| | | | Input | Output | |
| 110 | 7.5 | 50 / 60 | 780 | 370 | 650 |
| 120 | 6.7 | 50 / 60 | 780 | 370 | 650 |
| 220 | 3.7 | 50 / 60 | 780 | 370 | 650 |
| 230 | 3.6 | 50 / 60 | 780 | 370 | 650 |
| 240 | 3.4 | 50 / 60 | 780 | 370 | 650 |

| Model No. | | | | HR2440 | HR2441 | HR2442 |
|---|---|---|---|---|---|---|
| No load speed : (min -1= rpm) | | | | 0 - 1,100 | | 1,100 |
| Blows per min : (min -1= bpm). | | | | 0 - 4,500 | | 4,500 |
| Type of bit shank | | | | SDS - plus | | |
| Chuck ability | | | | 10 (3/8) | | |
| Drilling capacity : mm ( " ) | Steel | | | 13 (1/2 | | |
| | Wood | | | 32 (1-1/4) | | |
| | Concrete | TCT. hammer bit | | 24 (15/16) 25 (1) for North America | | |
| | | Core bit | | 54 (2-1/8) | | |
| | | Diamond core | Wet | 65 (2-9/16) | | |
| | | | Dry | 65 (2-9/16) | | |
| Single blow energy ( J ) | | | | 2.7 | | |
| Working mode | | | | 2 modes rotation rotation+percussion | | |
| Variable switch | | | | Yes | Yes | No |
| Clutch for protecting user from lock of bit | | | | Yes | Yes | Yes |
| Reverse switch | | | | Yes | No | No |
| Protection from electric shock | | | | by double insulation | | |
| Cord length : m (ft) | | | | 4(13.1) | 2.5(8.2) for Asia | 2.0(6.6) for Australia |
| Net weight : kg (lbs) | | | | 2.3 (5.1) | | |

**< Note > When using wet type dia. core, employ HR2440 series models connecting with residual current device.**

## ► Standard equipment

* Side grip ..... 1 pc.
* Plastic carrying case ..... 1 pc.
* Stopper pole (Depth gauge) .... 1 pc.

< Note > The standard equipment for the tool shown may differ from country to country.

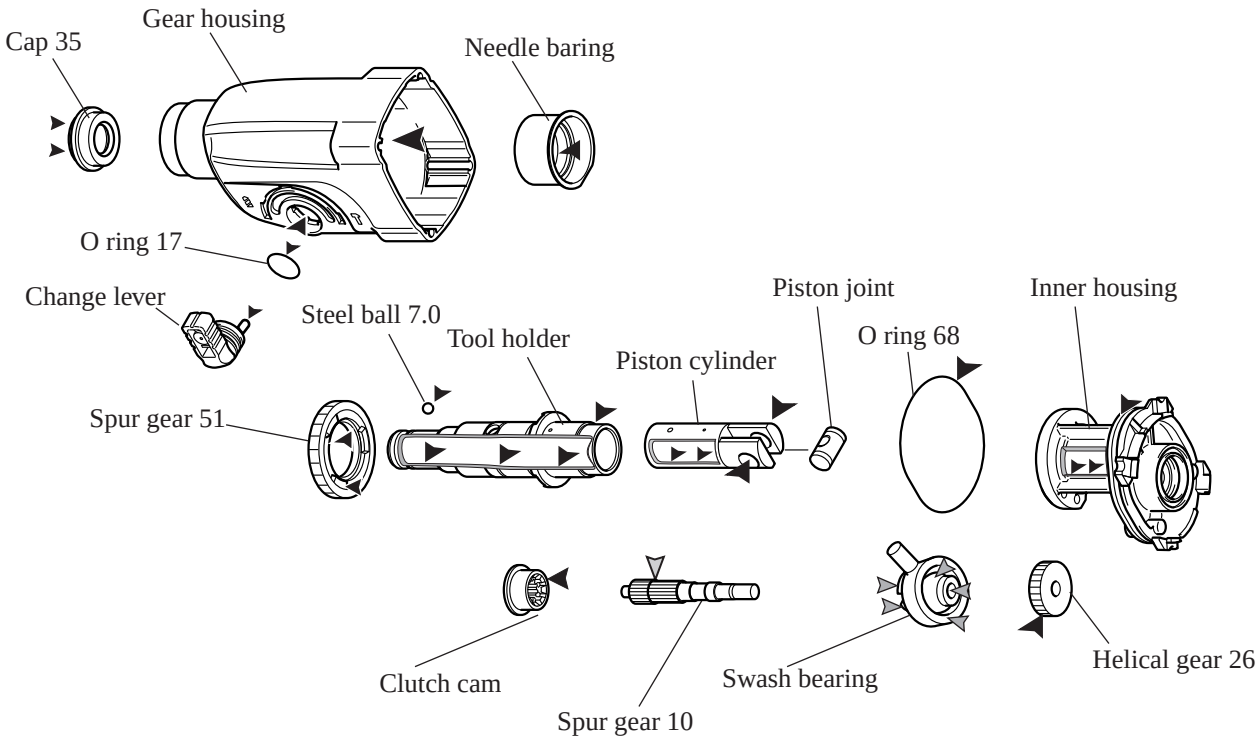
## ► Optional accessories

* SDS plus TCT. bits 5.5mm(7/32") - 24mm)15/16")
* Drill chuck assembly
* Chuck adapter
* Chuck key S-13
* Drill chuck S-13
* Holder driver
* Dust cups 5 and 9
* Safety goggle
* Bit grease
* Blow out bulb
* Core bits 32mm, 45mm, 54mm
* Core bit
* Core bit adapter
* Rod
* Dust extractor attachment
* Diamond core bits (wet and dry) 32mm, 38mm, 54mm, 65mm
* Water protection collar
* Various taper shank TCT. bits
* Taper shank adapter
* Cotter

< 1 > Lubrication

Apply the following MAKITA grease to protect parts and product from unusual abrasion.

* Grease RA No.1(Brown) to the portions marked with black triangle
* Grease FA No.2 to the portions marked with gray triangle




| | | |
|---|---|---|
| Cap 35 | Grease RA No.1 (Brown) | Inner lip of bit inserting side |
| Gear housing | Grease RA No.1 (Brown) : 60g | Inner portion where the mechanical parts are installed.<br>Groove for O ring 17 assembling portion |
| Needle bearing | Grease RA No.1 (Brown) | Inner ring |
| Change lever | Grease RA No.1 (Brown) | Top of the pins |
| O ring 17 | Grease RA No.1 (Brown) | Whole part |
| Spur gear 51 | Grease RA No.1 (Brown) | Inner portion where tool holder contacts<br>Convex portion of cam |
| Steel ball 7.0 | Grease RA No.1 (Brown) | Whole part |
| Tool holder | Grease RA No.1 (Brown) | Inner portion where piston cylinder contacts<br>The portion where inner housing contacts |
| Piston cylinder | Grease RA No.1 (Brown) | Inner portion where striker contacts<br>The portion where piston joint is assembled |
| O ring 68 | Grease RA No.1 (Brown) | Whole part |
| Inner housing | Grease RA No.1 (Brown) | Inner portion where tool holder contacts<br>The groove where O ring 68 is assembled |
| Spur gear 10 | Grease FA No.2 | Spline portion |
| Swash bearing 10 | Grease FA No.2 | Inner portion where cam shaft contacts<br>The surface where helical gear 26 contacts<br>The portion where balls are installed<br>Convex portion of cam |
| Helical gear 26 | Grease RA No.1 (Brown) | Whole of teeth portion |

< 2 > Disassembling chuck section

1. Slide chuck cover in the direction of gear housing, and pull out cap 35 by turning. See Fig. 1.
2. Take off ring spring 19. Then, the following parts can be disassembled from tool holder. See Fig. 1A.
   * Chuck cover
   * Ring 21
3. Take off steel ball 7.0 with which guide washer and conical compression spring 21-29 are held. See Fig. 1A.
   Then, guide washer and conical compression spring 21-29 can be disassembled from tool holder. See Fig. 1B.

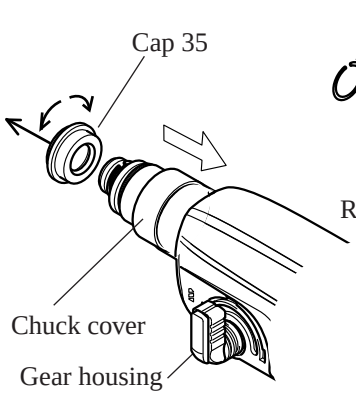



Fig. 1

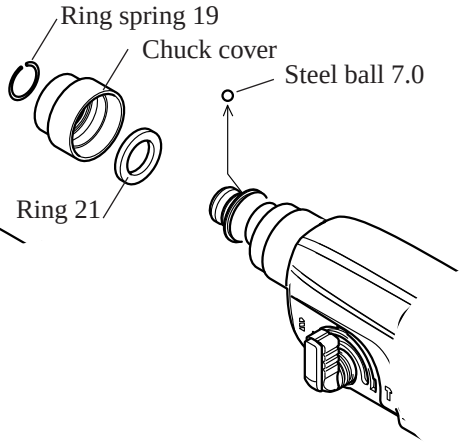



Fig. 1A

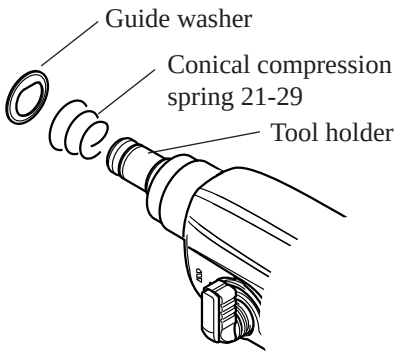


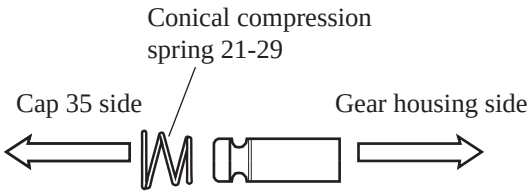

Fig. 1B

< 3 > Assembling chuck section

1. Apply grease to steel ball 7.0 and cap 35 referring to < 1 > Lubrication at page 2.
2. Assemble conical compression spring 21-29 and guide washer, and hold guide washer with steel ball 7.0. See Fig. 1B and Fig. 1A.
3. Assemble ring 21 and chuck cover to tool holder. And then, hold them with ring spring 19. See Fig. 1A.
4. Slide chuck cover in the direction of gear housing, and assemble cap 35 by turning. See Fig. 1.

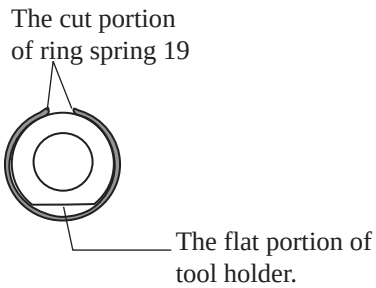
< Note in assembling >

A. Pay attention to the assembling direction of conical compression spring 21-29.




The small portion : Gear housing side
The large portion : Cap 35 side

B. The cut portion of ring spring 19 has to come to the opposite side of the flat portion of tool holder.



< 4 > Disassembling change lever

1. Disassemble cap from change lever by twisting the flat head screwdriver inserted between cap and change lever, as illustrated in Fig. 2.
2. Turn the change lever fully to the direction of rotary hammer mode and pull off change lever from gear housing as illustrated in Fig 2A.

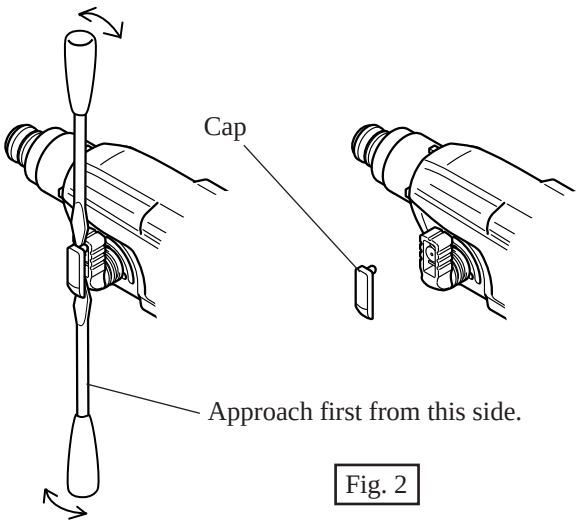



Fig. 2

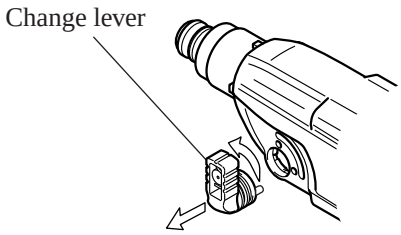



Fig. 2A

Apply grease to the pin, before assembling.

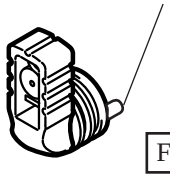


Fig. 2B

< 5 > Assembling change lever

1. Apply grease RA No.1 (Brown) to the top of change lever's pin. See Fig. 2B.

   **< Note > The neglect of the grease to the pin portion can be cause of the damage on the change lever. during the work in "rotation only" mode.**

2. Aligning change lever with the rotary hammer mode, assemble it by pressing to the assembling hole as illustrated in the above Fig. 2A. And assemble cap by pressing to change lever.

< 6 > Disassembling armature

1. Disassemble handle cover by unscrewing tapping screw 4 x 25. And disassemble carbon brushes as illustrated in Fig. 3.
2. Separate gear housing together with armature, from motor housing by unscrewing tapping screws 4 x 45 as illustrated in Fig. 3A.
3. Slightly hitting the edge of gear housing with plastic hammer, remove armature from inner housing assembled in gear housing. See Fig. 3B.
4. Ball bearings of fan side and commutator side can be disassembled with No.1R269 "Bearing extractor (small)". See Fig. 3C.

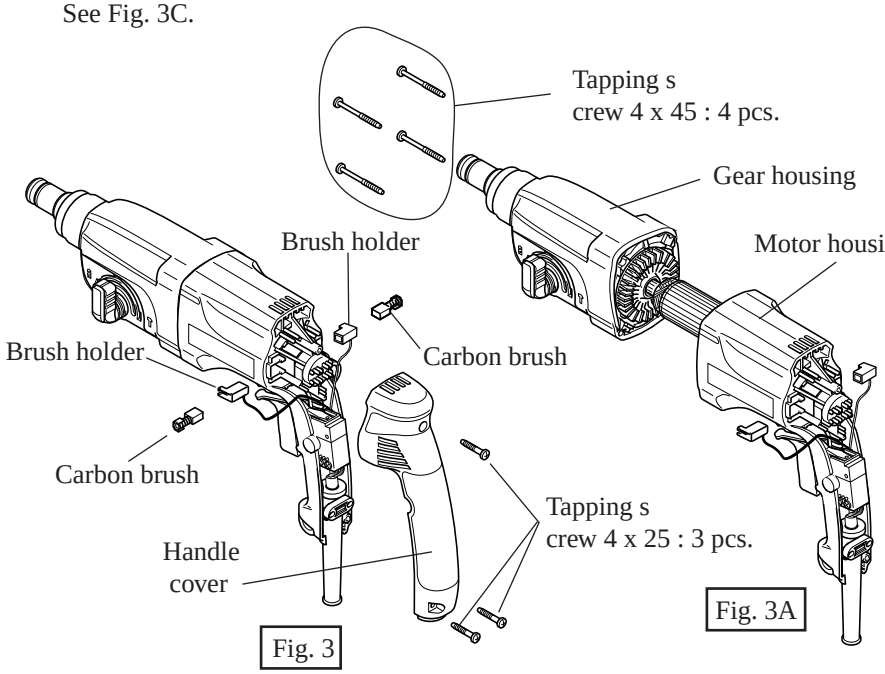



Fig. 3

Fig. 3A

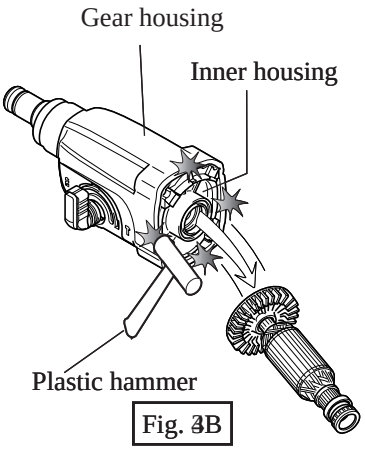



Fig. 3B

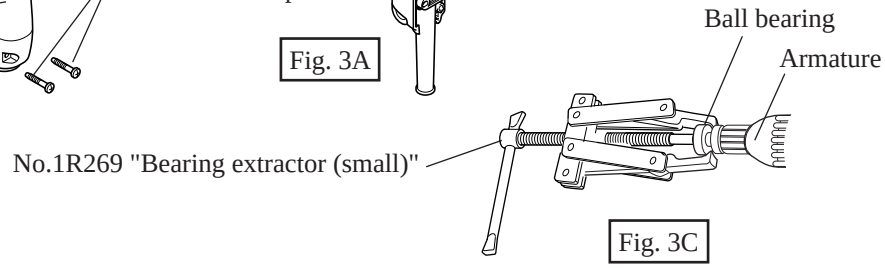



Fig. 3C

# Repair

< 7> Disassembling tool holder section

1. Disassemble change lever from gear housing as mentioned in < 4 > Disassembling change lever at page 4.
2. Separate gear housing from motor housing as illustrated in Fig. 3 and Fig. 3A. And disassemble armature as illustrated in Fig. 3B at page 4.
3. Disassemble inner housing from gear housing as illustrated in Fig. 4.
4. Separate tool holder section from inner housing as illustrated in Fig. 4A. Pay attention, not to lose flat washer 28, when separating tool holder section.

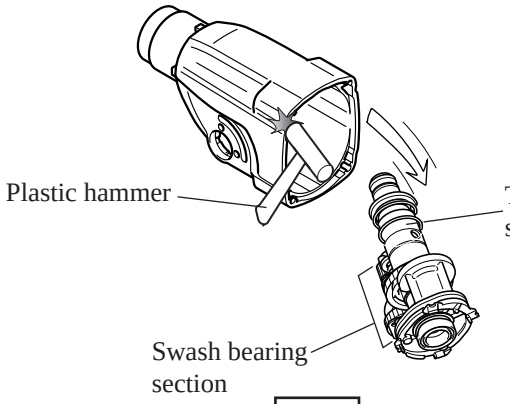



Fig. 4

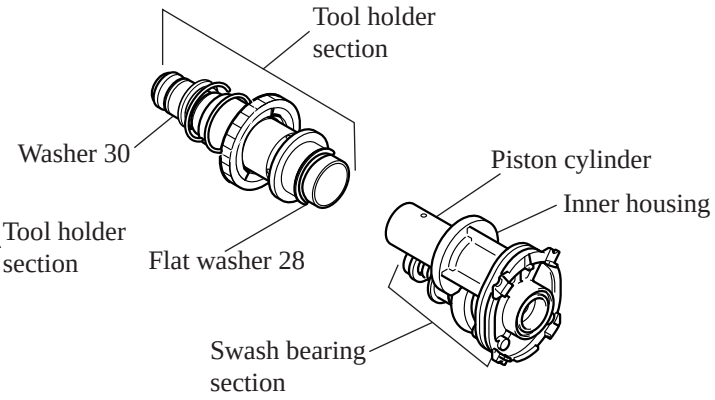



Fig. 4A

5. Ring spring 28 can not be removed without pressing washer 30 down to the spur gear 51 side, because it is almost covered by washer 30. See Fig. 4B.
6. Disassemble ring spring 28 with retaining ring plier, pressing washer 30 down to the spur gear 51 side as illustrated in Fig. 4C and Fig. 4D.
7. Disassemble washer 30, compression spring 31 and spur gear 51 from tool holder as illustrated in Fig. 5E.

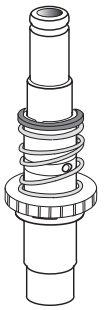


Fig. 4B

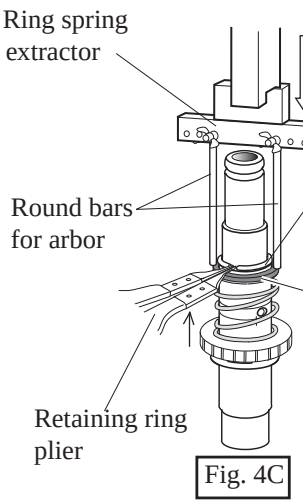



Fig. 4C

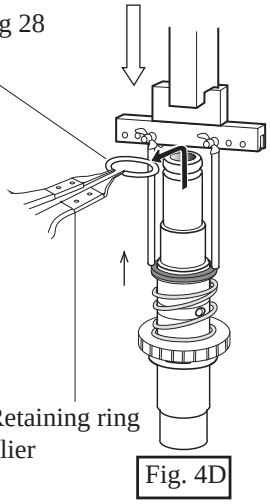



Fig. 4D

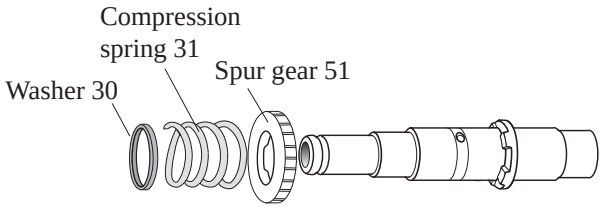



Fig. 4E

< 8 > Assembling tool holder section

1. Apply grease to spur gear 51 and tool holder referring to < 1 > Lubrication at page 2.
2. Assemble spur gear 5, compression spring 31 and washer 30 to tool holder as illustrated in Fig. 4E.
3. Pressing the washer 30 down to the spur gear 51 side, with arbor press, assemble ring spring 28 as illustrated in Fig. 4D and Fig.4C.
4. Assemble flat washer 28 to the position illustrated in Fig. 4A at page 5.
5. Insert piston cylinder of swash bearing section into tool holder. And assemble tool holder section by pressing into inner housing as illustrated in fig. 4A.

< 9 > Disassembling impact bolt

1. Referring to "< 7 > Disassembling tool holder section" at page 5, disassemble ring spring 28, washer 30, compression spring 31 and spur gear 51 from tool holder. See Fig. 4, Fig. 4A, 4B, 4C, D and 4E.
2. Push the cut portion of ring spring 28 to the out side of the hole as illustrated in Fig. 5 and Fig. 5A.

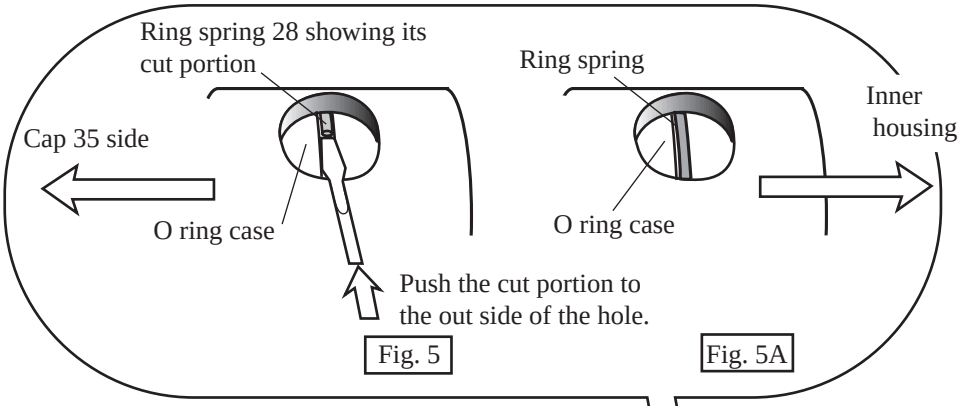
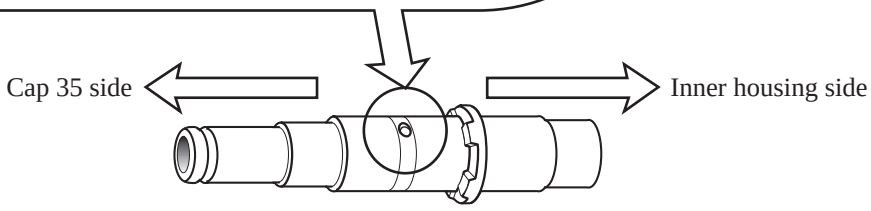



Fig. 5 Fig. 5A




3. Hold tool holder with "No.1R038 Armature holder" and vise as illustrated in Fig. 5B. Insert screwdriver between ring spring 28 and O ring case. and push out ring spring 28 from the inner groove as illustrated in Fig. 5C.

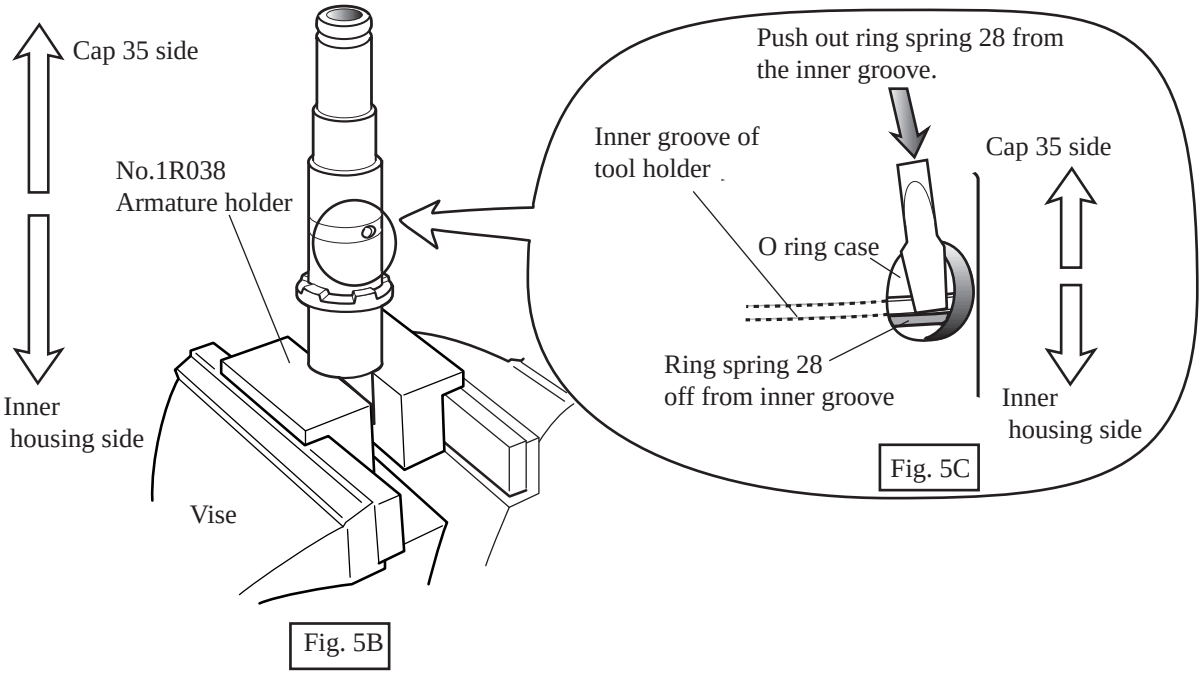



Fig. 5B Fig. 5C

4. Insert "No.1R236 Round bar for arbor" and push ring spring 28 as deep as possible to the inner housing side by striking the round bar for arbor as illustrated in Fig. 5D.
5. Pick up ring spring 28 with plier and take off it from tool holder as illustrated in Fig. 5E.
6. Disassemble the following parts from tool holder as illustrated in Fig. 5F.
   * O ring case equipped with O ring 9
   * O ring 15
   * Ring 9
   * Impact bolt equipped with O ring 12
7. Clean the inside of tool holder completely.

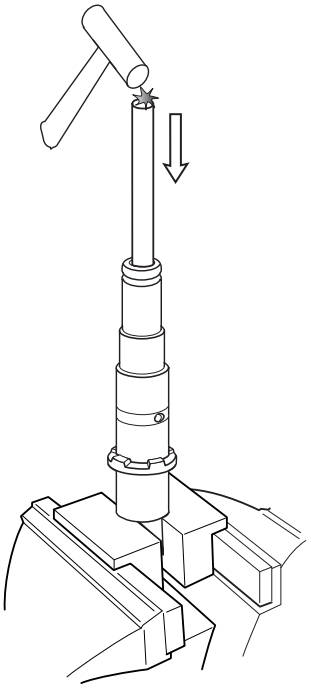


Fig. 5D.

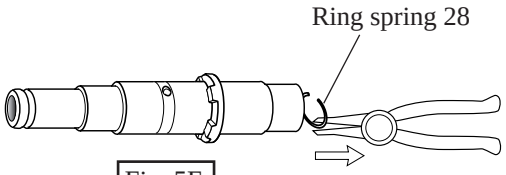



Fig. 5E

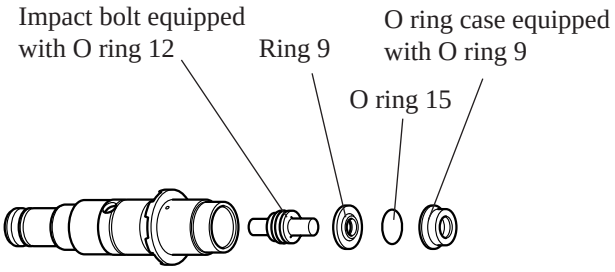



Fig. 5F

< 10 > Assembling impact bolt

1. Apply grease to the O rings referring to < 1 > Lubrication at page 2
   * O ring 9 for O ring case
   * O ring 15
   * O ring 12 for impact bolt
2. Insert impact bolt, ring 9, O ring 15 and O ring case with O ring 9 into tool holder as illustrated in Fig. 5F.
3. Assemble ring spring 28 to the inner groove of tool holder by pushing it with screwdriver. Ring spring 28 has to be assembled as illustrated in Fig. 6.

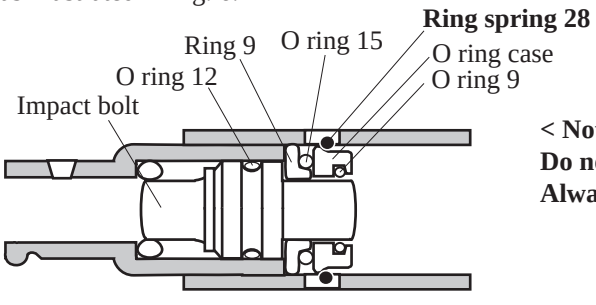



Fig. 6

**< Note >**
**Do not install the used ring spring 28.**
**Always assemble the fresh one.**

< 11 > Disassembling swash bearing

1. Referring to Fig. 3, 3A, 3B at page 4, disassemble the product.
   And separate inner housing together with tool holder section and swash bearing section from gear housing as illustrated in Fig. 8 and Fig. 8A. Ball baring 606ZZ can remain in gear housing in this stage. If so, refer to Fig. 8D.
2. Separate tool holder section from inner housing as illustrated in Fig. 8A.

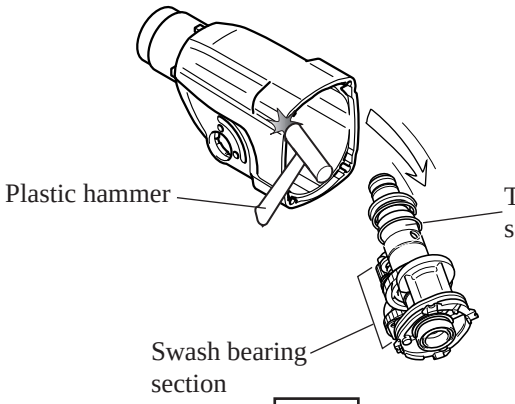



Fig. 8

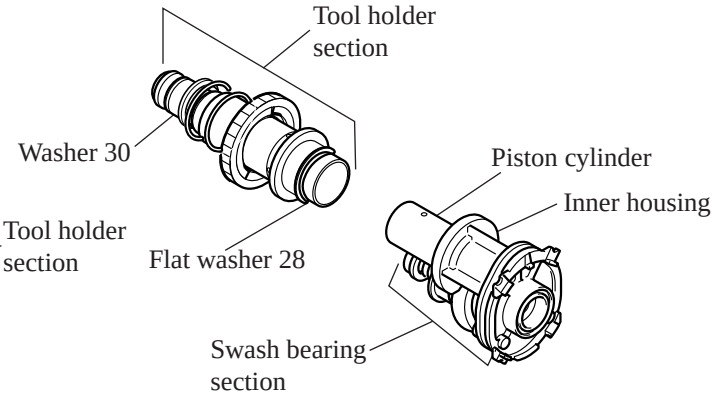



Fig. 8A

3. Swash bearing section is held in inner housing with bearing retainer which is fastened with 2 pcs. of hex socket head bolts M4x12. Take off these hex socket head bolts M4x12 for disassembling swash bearing section. See Fig. 8B.

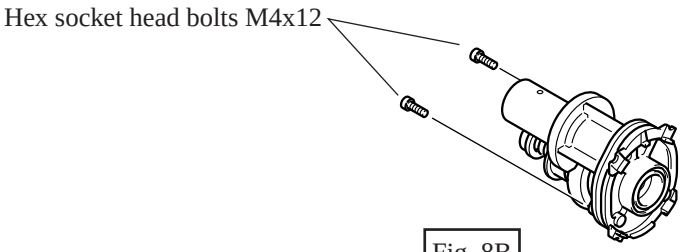



Fig. 8B

4. Bring piston cylinder to the dead point. And , twist the the swash bearing section, with pulling off them from inner housing. Then swash bearing section and change plate can be disassembled from piston cylinder. See Fig. 8C.

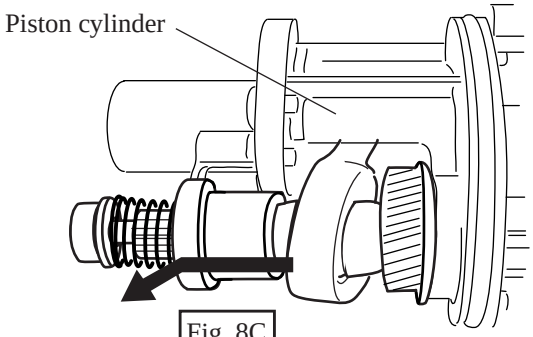



Fig. 8C

5 If ball bearing 606ZZ remains in gear housing in the step of Fig. 8, reassemble swash bearing section temporarily to gear housing, and hold gear housing as illustrated in Fig. 8D. So, swash bearing section tilts in the direction of arrow. Keeping the illustrated position, disassemble swash bearing section by striking the edge of gear housing with plastic hammer. So, ball bearing 606ZZ can be removed together with swash bearing section.

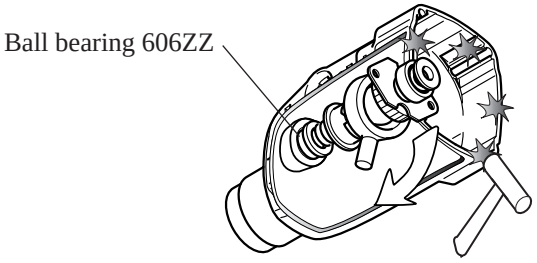



Fig. 8D

6. Swash bearing section can not be disassembled in one action by pressing cam shaft with arbor press, because Take the following steps for disassembling them.
   1. Disassemble ring 8 by pressing with arbor press as illustrated in Fig. 9.
   2. Disassemble ball bearing 608ZZ with bearing extractor as illustrated in Fig. 9A.
   3. Disassemble flat washer 8 and bearing retainer as illustrated in Fig. 9B.
   4. Disassemble helical gear 26 by pressing with arbor press as illustrated in Fig. 9C.

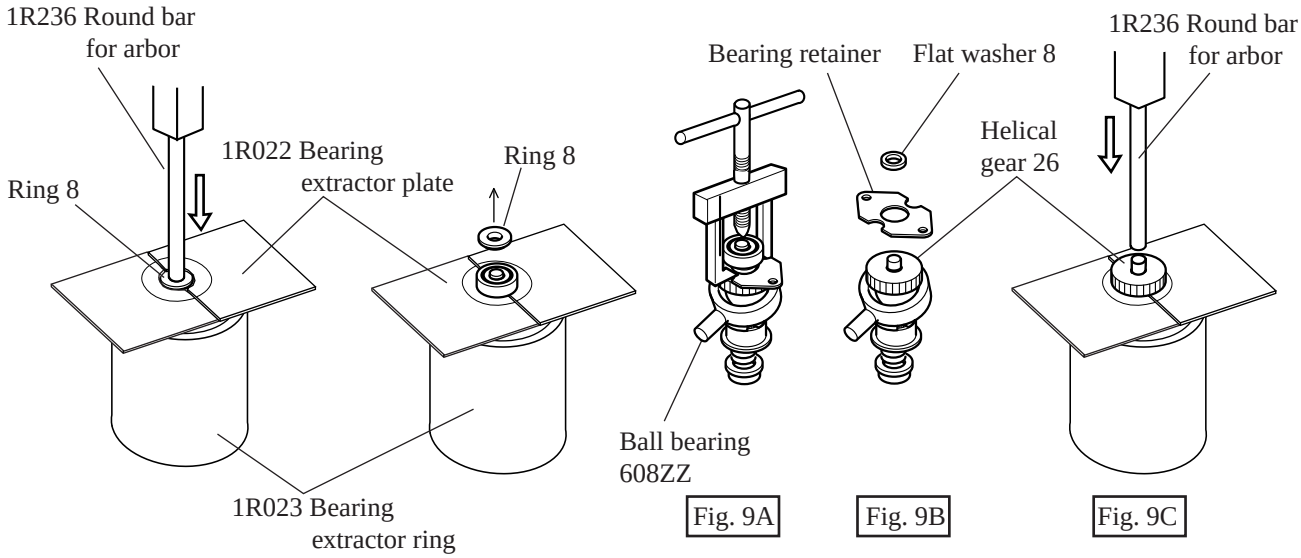



Fig. 9 Fig. 9A Fig. 9B Fig. 9C

5. After disassembling helical gear 26, swash bearing 10, clutch cam, compression spring 12 and flat washer 12 can be separated from spur gear 10 as illustrated in Fig. 9.
6. Disassemble ball bearing 606ZZ with bearing extractor as illustrated in Fig. 9E.

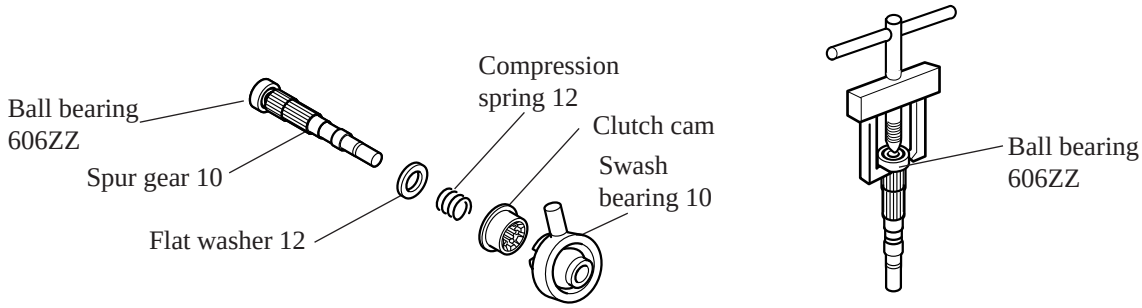



Fig. 9D Fig. 9E

<12> Assembling swash bearing section

1. Apply grease to the parts of swash bearing section referring to < 1 > Lubrication at page 2.
2. Assemble ball bearing 606ZZ by pressing spur gear 10 with arbor press as illustrated in Fig. 10.
3. Set the parts on spur gear 10 in the following order. See Fig. 10A.
    1. Flat washer 12
    2. Compression spring 12
    3. Clutch cam
    4. Swash bearing 10
    5. Helical gear 26

    Align the splines of clutch cam and swash bearing with the same of spur gear 10, when setting them to spur gear 10.
4. Put the above temporarily assembled swash bearing section on the bearing setting plate, and press them with arbor press as illustrated in Fig. 10B.
5. Assemble flat washer 8 and bearing retainer. And then, assembled ball bearing 608ZZ by pressing with arbor press as illustrated in Fig. 10C.
6. Assemble ring 8 by pressing with arbor press as illustrated in Fig. 10D.

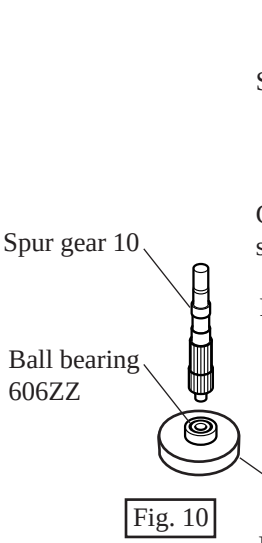


Fig. 10

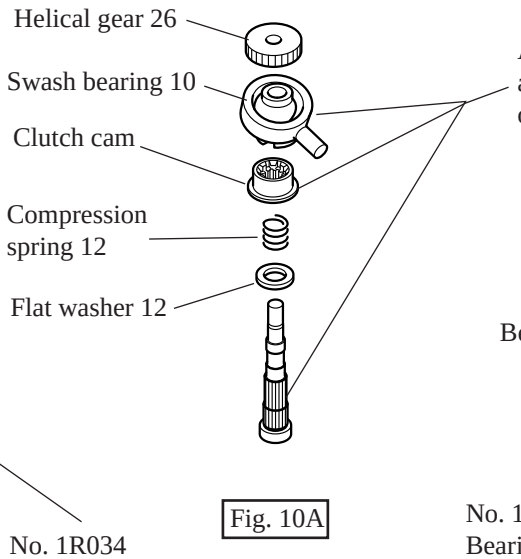


Fig. 10A

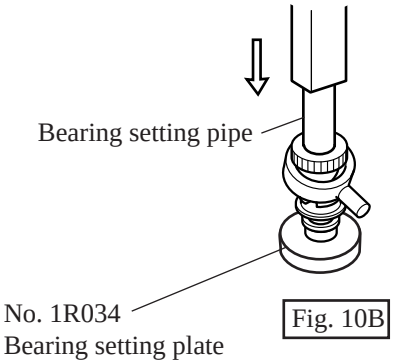


Fig. 10B

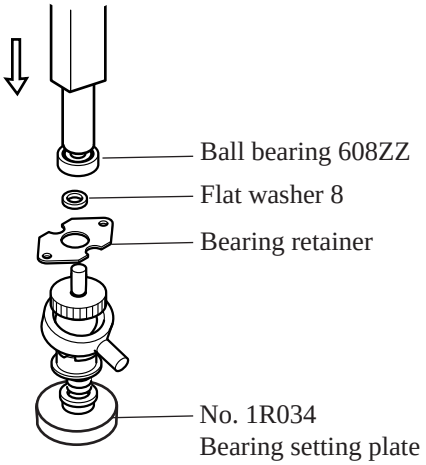


Fig. 10C

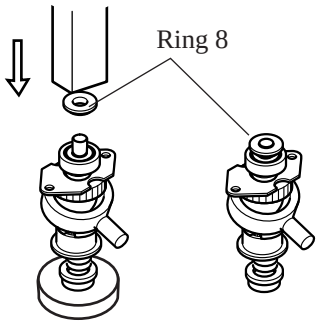


Fig. 10D

<13> Assembling swash bearing section to piston cylinder

1. Apply MAKITA grease to piston cylinder and swash bearing 10 referring to <1> Lubrication at page 2.
2. Assemble 2 pcs. of flat washers 12 and piston joint to piston cylinder as illustrated in Fig. 11.
3. Insert the above piston cylinder into inner housing as illustrated in Fig. 11A.
4. Moving piston cylinder to the dead point for swash bearing 10, assemble swash bearing 10 to piston cylinder by inserting its pole into the hole of piston joint as illustrated in Fig. 11B.
5. Fasten bearing retainer which has been assembled to swash bearing section in the step of Fig. 10C, with adhesive hex socket head bolt M4 x 12, onto inner housing as illustrated in Fig. 11C. Fig. 11

**< Note >**

**Do not fasten with the used hex socket head bolt M4 x 12. Always use the fresh adhesive hex socket head bolt M4 x 12.**

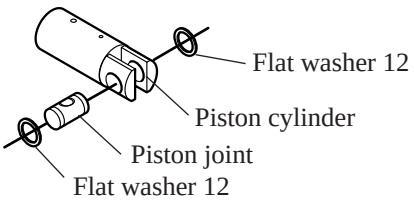



Fig. 11

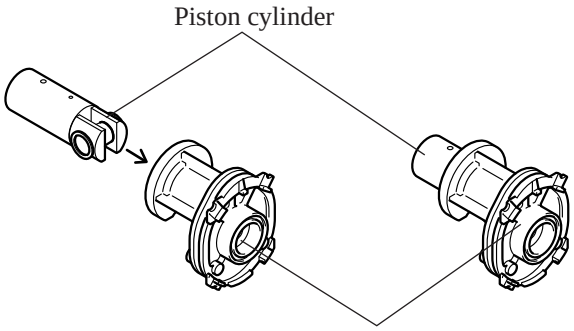



Fig. 11A

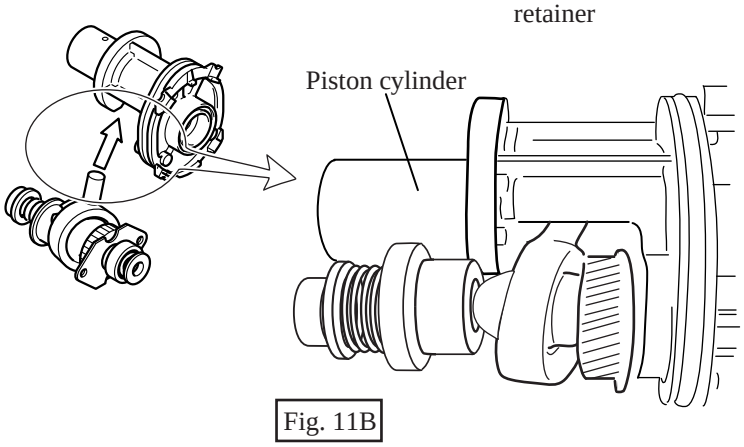



Fig. 11B

Fig. 11C

<14> Disassembling needle bearing complete

Strike the work table with gear housing. Then, needle baring complete can be disassembled from gear housing as illustrated in fig. 12.

**< Note >**

**Cover the work table with something soft to avoid the damage on gear housing. before disassembling.**

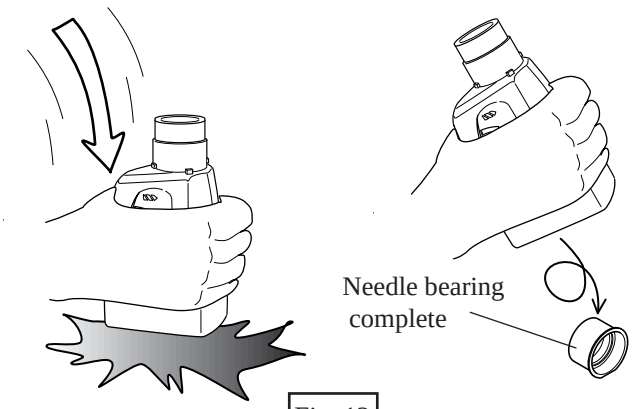



Fig. 12

< 15 > Assembling needle bearing complete

1. Apply MAKITA grease RA No.1 to the inside of needle baring complete.
2. Putting needle bearing complete on No.1R165 "Ring spring setting tool B" press gear housing onto the needle bearing complete with arbor press as illustrated in Fig. 13.

**< Note in assembling >**
**Pay attention to the assembling position of needle bearing complete.**
**The fat portion of needle bearing complete has to be faced to the belly side of gear housing.**

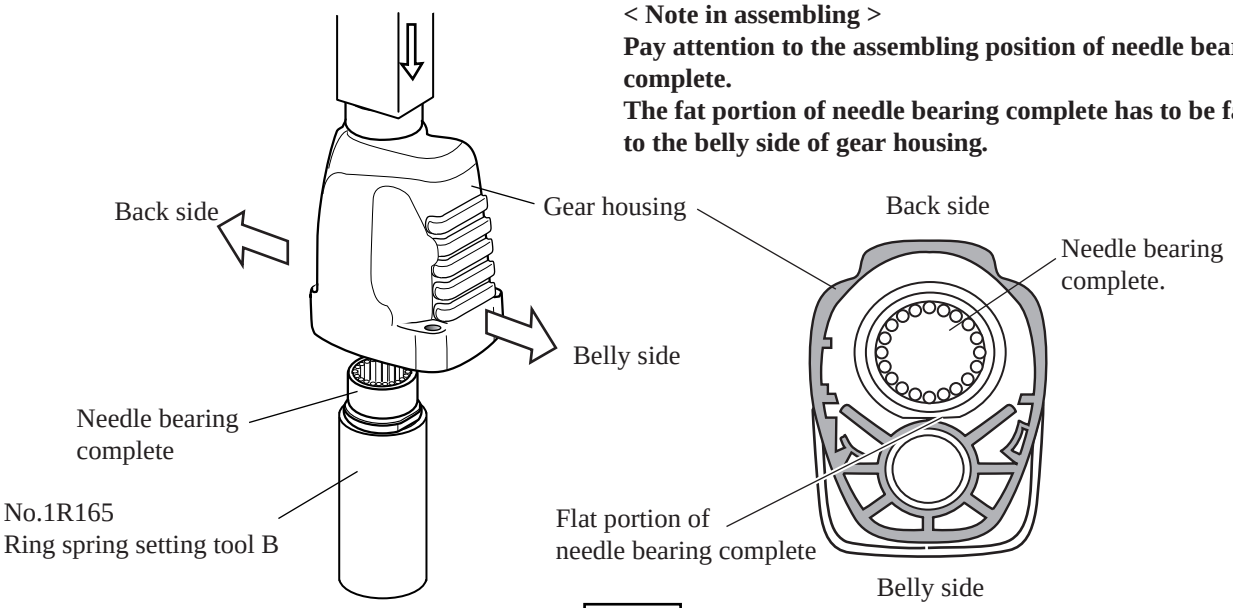



Fig. 13.

< 16 > Replacing electrical parts in handle

Disassemble handle cover by unscrewing 3 pcs. of tapping screws 4x25, and disassemble strain relief by unscrewing 2 pcs. of tapping screws 4x18 as illustrated in Fig.14.
Then, switch, noise suppressor, power supply cord, etc. can be replaced.

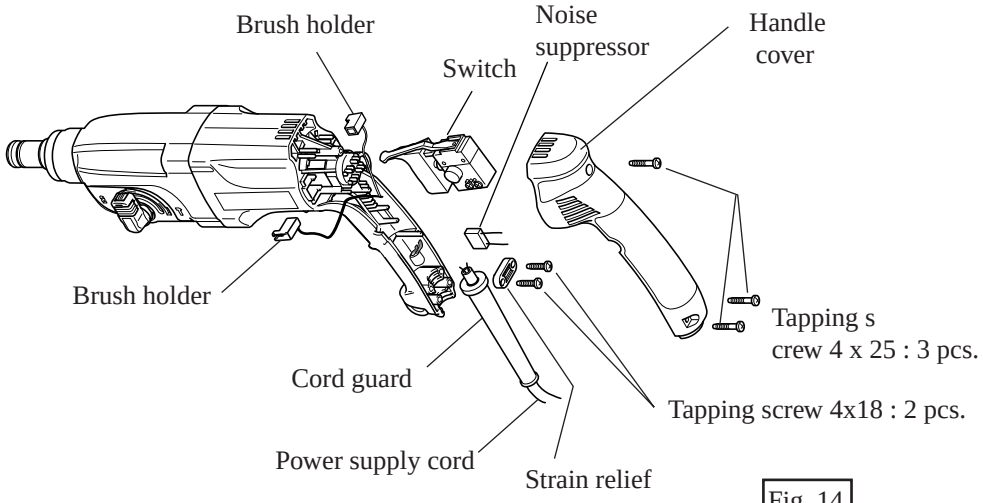



Fig. 14

< 17 > Maintenance

It is recommended to change the following parts, when replacing carbon brushes. See Fig. 15.

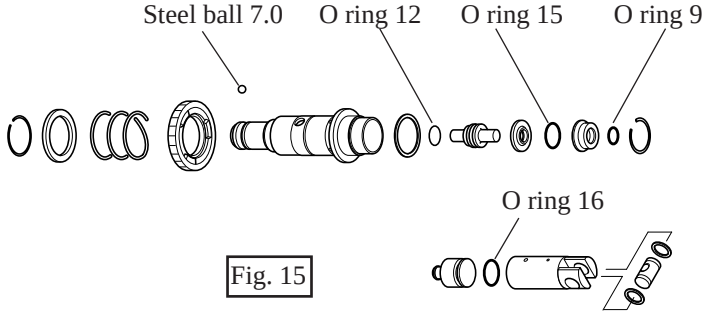
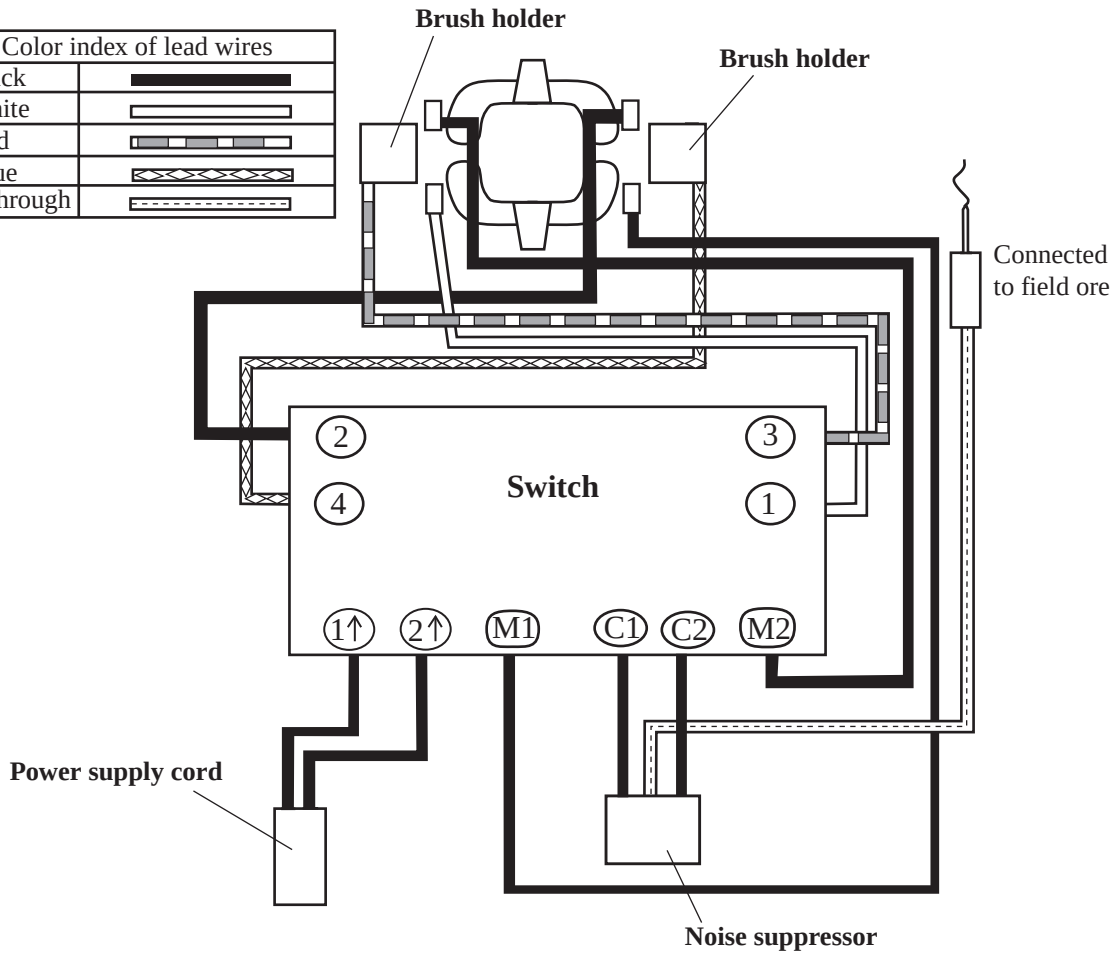



Fig. 15

# Circuit diagram

## Model HR2440 with reverse switch

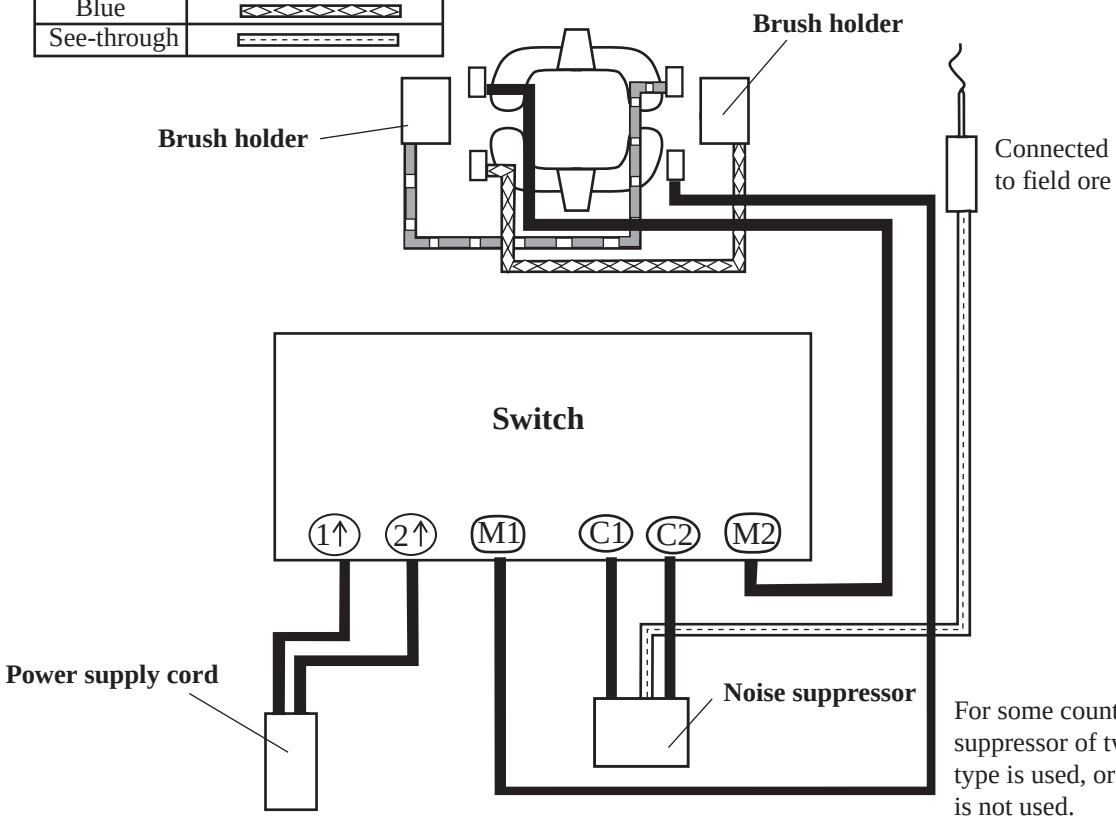
| Color index of lead wires |
|---|
| Black |
| White |
| Red |
| Blue |
| See-through |




For some countries, noise suppressor of two lead wire type is used, or noise suppressor is not used.

## Model HR2441, HR2442 without reverse switch

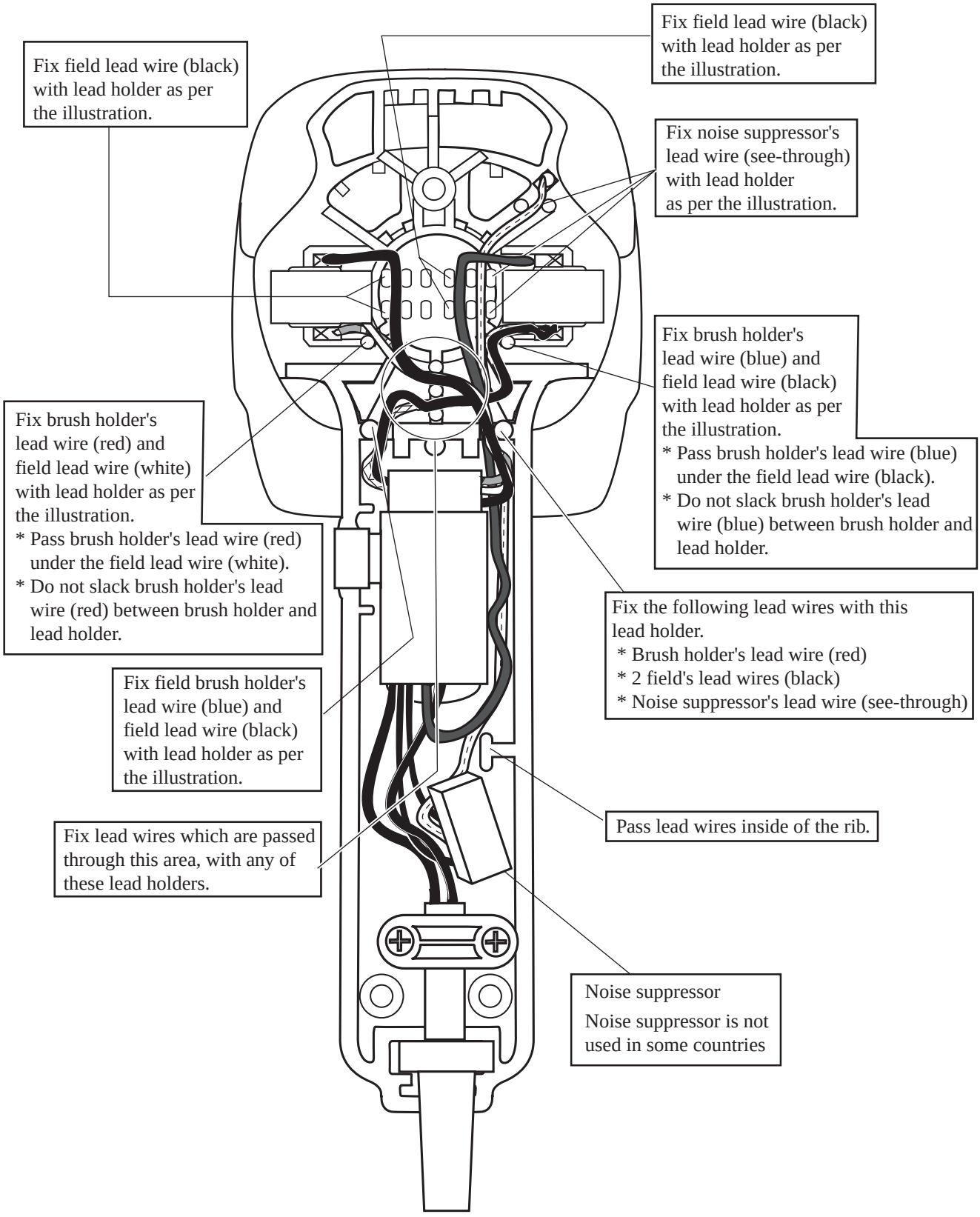
| Color index of lead wires |
|---|
| Black |
| Red |
| Blue |
| See-through |

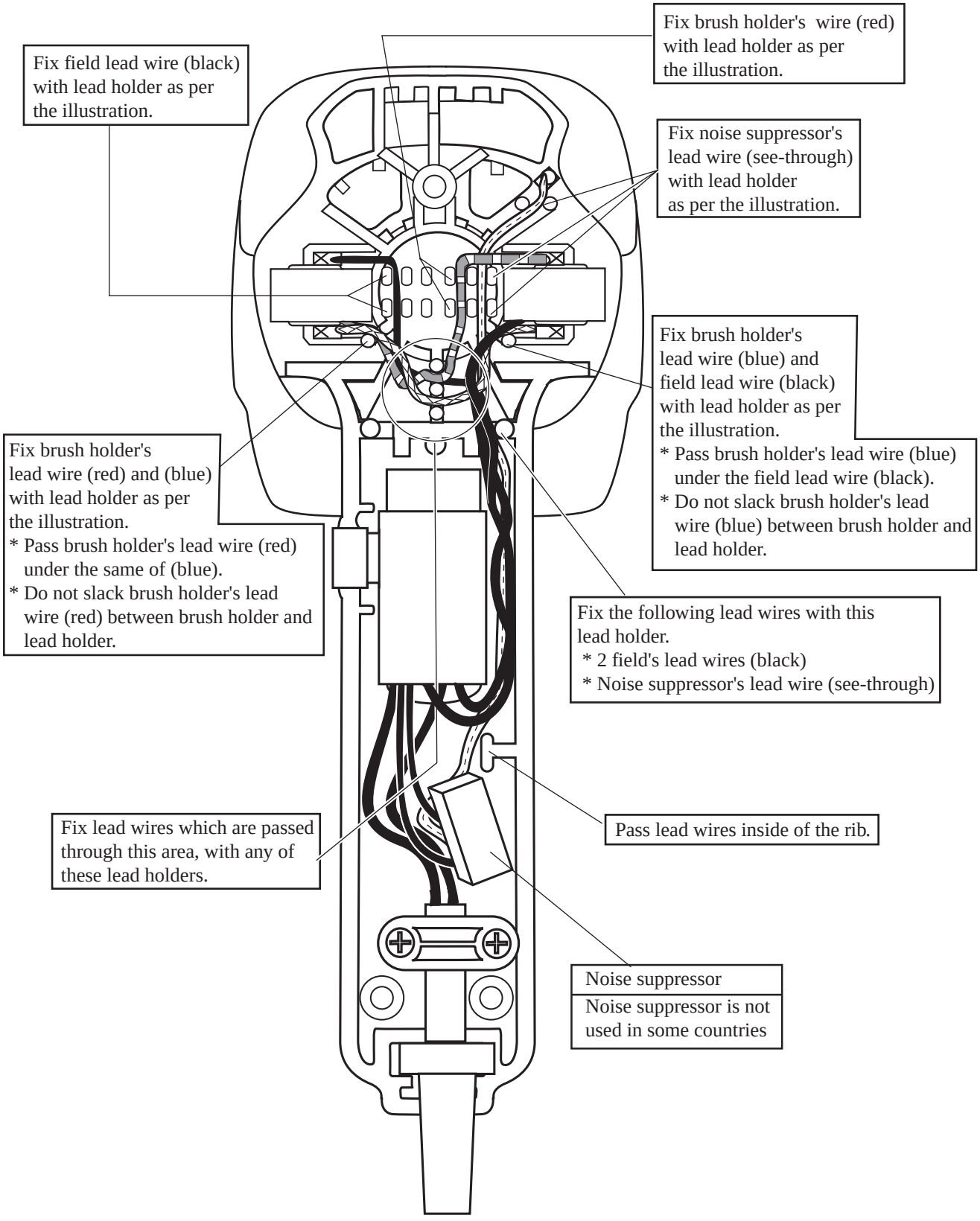



For some countries, noise suppressor of two lead wire type is used, or noise suppressor is not used.

## Wiring diagram

**Model HR2440 with reverse switch**



## Wiring diagram

**Model HR2441, HR2442 without reverse switch**